CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/WNo.06/LG/CSR-06/057n/CEMENT/2016-17 Date: 06.06.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. L. Gangadhar** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
*NAME OF THE WORK	:	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	04.06.2016
PERIOD OF TESTING	:	04.06.2016 to 06.06.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	30.00 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	155 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	485 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

****

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Quality Manager

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T-2377

Job No.: CTCE/BBMP/WNo.06/LG/CSR-06/057n/SAND-Gradation/2016-17 : 06.06.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. L. Gangadhar**
No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.

*** Name of Work** : Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 04.06.2016

Date of Testing : 06.06.2016

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Spec.Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	94.20	90-100	90-100	90-100	95-100
2.36	76.00	60-95	75-100	85-100	95-100
1.18	47.50	30-70	55-90	75-100	90-100
600 Micron	17.00	15-34	35-59	60-79	80-100
300 Micron	8.80	5-20	8-30	12-40	15-50
150 Micron	4.30	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/WNo.06/LG/CSR-06/057n/AGG/GR/2016-17 : 06.06.2016

TEST REPORT ON COARSE AGGREGATES

* Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. L. Gangadhar** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
* Name of Work	: Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Technical Reference	: IS : 2386 Part 1 -1963 RA-2007
Sample ID	: Coarse Aggregates (40mm)
Sample Received on	: 04.06.2016
Date of Testing	: 06.06.2016

Total Wt. of Aggregates in gms= **7000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Spec.Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	98.21	95-100	85-100
20	41.07	30-70	0-20
10	12.50	10-35	0-5
4.75	1.07	0-5	-

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits.

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Job No.: CTCE/BBMP/WNo.06/LG/CSR-06/057n/AGG/GR/2016-17 : 06.06.2016

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. L. Gangadhar**
No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.

*** Name of Work** : Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.

*** Reference** : BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016

Technical Reference : IS : 2386 Part 1 -1963 RA-2007

Sample ID : Coarse Aggregates (20mm)

Sample Received on : 04.06.2016

Date of Testing : 06.06.2016

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS :383-1970 (RA- 2007)	
		Graded	Single Sized
40	100	100	100
20	97.00	95-100	85-100
10	28.70	25-55	0-20
4.75	5.70	0-10	0-5

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits

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Job No.: CTCE/BBMP/WNo.06/LG/STEEL/2016-17 10.06.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. L. Gangadhar,** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
Name of the Work	:	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Date of Test	:	10.06.2016
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	8	0.40	510	552	13.10	O.K	O.K

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Job No.: CTCE/BBMP/WNo.06/LG/STEEL/2016-17 10.06.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. L. Gangadhar,** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
Name of the Work	:	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Date of Test	:	10.06.2016
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	12	0.89	515	558	13.50	O.K	O.K

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Job No.: CTCE/BBMP/WNo.06/LG/STEEL/2016-17 10.06.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. L. Gangadhar,** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
Name of the Work	:	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Date of Test	:	10.06.2016
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm^2	Tensile strength (Ultimate stress) N/mm^2	Elongation percent gauge length		
1	16	1.58	520	563	13.75	O.K	O.K

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Job No.: CTCE/BBMP/WNo.06/LG/CSR-06/057n/CUBE/2016-17 13.07.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. L. Gangadhar**
No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.

*** Name of the work** : Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016

*** Sample ID** : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : M_{20}

Compressive Strength as on : 28^{th} day

Sample Received on : 13.07.2016

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	15.06.2016	13.07.2016	8.182	478.3	21.26
2	15.06.2016	13.07.2016	8.259	493.6	21.94
3	15.06.2016	13.07.2016	8.315	502.3	22.32

* Information is furnished by the Customer/Representative

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Job No.: CTCE/BBMP/WNo.06/LG/CSR-06/057n/CUBE/2016-17 16.07.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. L. Gangadhar** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
* Name of the work	: Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
* Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS:.516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 16.07.2016

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	18.06.2016	16.07.2016	8.265	482.5	21.44
2	18.06.2016	16.07.2016	8.315	493.2	21.92
3	18.06.2016	16.07.2016	8.478	502.3	22.32

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Job No.: CTCE/BBMP/WNo.06/LG/WBM-II/2016-17 Date: 04.07.2016

REPORT

Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	:	**Mr. L. Gangadhar** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
Name of the Work	:	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Type of Mix	:	Water Bound Macadam (Grade-II Metal)
Date of Sampling	:	02.07.2016
Date of Testing	:	04.07.2016

1) SEIVE ANALYSIS :

IS Sieve designation Size, mm	Percentage Passing for Graded Aggregate of Nominal size	Percentage by Weight Passing as per MORTH table 400-7
90mm	100.00	100.00
63mm	94.85	90-100
53mm	28.30	25-75
45mm	11.30	0-15
22.4mm	1.85	0-5

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Job No.: CTCE/BBMP/WNo.06/LG/WBM-II/AIV/2016-17 04.07.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. L. Gangadhar** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
Name of the Work	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Source / Location	WBM Mix Plant, Bangalore
Type of Mix	Water Bound Macadam
Date of Testing	04.07.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	88	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	293	
4	Aggregate Impact value = percent fines	22.62	23.30	
	100* (W_2/W_1)%			22.96

Comments:

→ Maximum allowable Aggregate Impact value for Water Bound Macadam is 30%

Note:

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Job No.: CTCE/BBMP/WNo.06/LG/WBM-II/S-T/2016-17 04.07.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. L. Gangadhar** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
Name of Work	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Water Bound Macadam (Grade-II Metal)
Date of Testing	04.07.2016

Result : Flakiness Index = **11.98%**

Elongation Index = **13.23%**

Result : Combined Flakiness & Elongation index 25.21%

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Job No.: CTCE/BBMP/WNo.06/LG/WBM-III/2016-17 Date: 08.07.2016

REPORT

Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency		**Mr. L. Gangadhar** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
Name of the Work	:	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Type of Mix	:	Water Bound Macadam (Grade-III Metal)
Date of Sampling	:	06.07.2016
Date of Testing	:	08.07.2016

1) SEIVE ANALYSIS:

IS Sieve designation Size,mm	Percentage Passing for Graded Aggregate of Nominal size	Percentage by Weight Passing as per MORTH table 400-7
63mm	100.00	100.00
53mm	97.55	95-100
45mm	68.65	65-90
22.4mm	6.10	0-10
11.2mm	3.15	0-5

Note:

⇒ The report shall not be reproduced, except in full, without the written approval of the laboratory.

⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory.

⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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Job No.: CTCE/BBMP/WNo.06/LG/WBM-III/AIV/2016-17 08.07.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. L. Gangadhar** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
Name of the Work	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Source / Location	WBM Mix Plant, Bangalore
Type of Mix	Water Bound Macadam
Date of Testing	08.07.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	379	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	79	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	299	
4	Aggregate Impact value = percent fines	20.90	21.11	
	$100^* (W_2/W_1)\%$			21.00

Comments:

→ Maximum allowable Aggregate Impact value for Water Bound Macadam is 30%

Note:

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Job No.: CTCE/BBMP/WNo.06/LG/WBM-III/S-T/2016-17 08.07.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. L. Gangadhar** No. 22, 2nd Cross, Lingappa Block, R.T. Nagara, Bangalore - 32.
Name of Work	Improvements to roads and drains at Bharath Nagar Church Raod in Ward No. 6, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/12/2016-17 Dated: 30.04.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Water Bound Macadam (Grade-III Metal)
Date of Testing	08.07.2016

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.35%**

Elongation Index = **13.80%**

Result : Combined Flakiness & Elongation index 26.15%

Note:

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2. The results indicated above are based on the tests carried out on the samples collected by the laboratory.
3. Any Query regarding the report must be reported within 30 days from the date of testing.

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